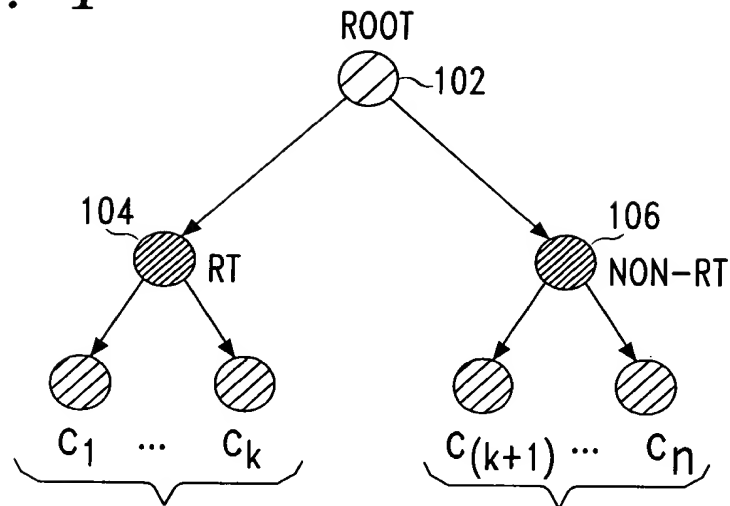


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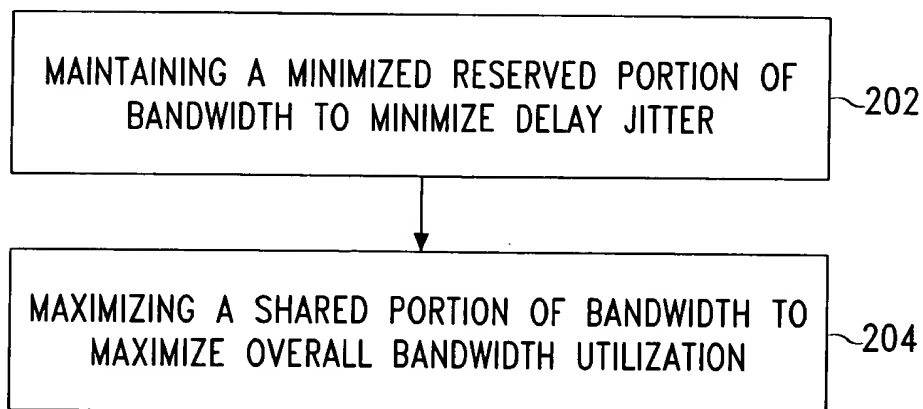
FIG. 1



WHERE BORROWING  
PERMIT FOR  $C_1 \dots C_k$   
PERMITS TEMPORARY  
BORROWING FROM RT  
104 AND ROOT 102

WHERE BORROWING PERMIT  
FOR  $C_{(k+1)} \dots C_n$   
PERMITS TEMPORARY  
BORROWING FROM NON-RT  
106 ONLY

FIG. 2



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FIG. 3

COMPUTER-READABLE MEDIUM/METHOD

MEASURING A PREDETERMINED PARAMETER AT PREDETERMINED OBSERVATION WINDOW TIMES

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DYNAMICALLY ADJUSTING ALLOCATED BANDWIDTH FOR PARENT CLASSES OF REAL-TIME TRAFFIC BY ADJUSTING AN AVERAGE OF THE PREDETERMINED PARAMETER TO HAVE A VALUE WITHIN A PREDETERMINED STABLE REGION

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WHERE THE PREDETERMINED PARAMETER IS A NUMBER OF BORROWING ATTEMPTS DURING A MEASUREMENT WINDOW, A MAXIMUM BANDWIDTH AND A MINIMUM BANDWIDTH FOR THE PREDETERMINED STABLE REGION IS DETERMINED BY:

If  $A_{i\_avg} < Thr(A_i)^{lower}$ ,  $B_i = maximum(B_i - \omega_i, Min(B_i))$

Else If  $A_{i\_avg} > Thr(A_i)^{upper}$ ,  $B_i = minimum(B_i - \omega_i, Max(B_i))$

WHERE EXPONENTIAL SMOOTHING INCLUDES:

$A_{i\_avg} \leftarrow (1-a) * A_{i\_avg} + a * A_i$ , WHERE A VALUE OF  $a$  IS PRESELECTED AS A NEGATIVE POWER OF TWO AND  $A_{i\_avg}$  IS UPDATED EVERY OBSERVATION WINDOW, A PRE-DETERMINED PARAMETER IN SECONDS AND

THE QUEUE LENGTH  $Q_i$  FOR CLASS  $i$  MAY BE RELATED TO THE UPPER BOUND OF DELAY JITTER AS:

$$DELAY\_JITTER\_i = Q_i / B_i$$

SUCH THAT, WHERE THE DESIRED JITTER UPPER BOUND  $Delay\_jitter\_i$  IS GIVEN, THEN A LINEAR RELATIONSHIP EXISTS BETWEEN  $Q_i$  AND  $B_i$  (ALLOCATED BANDWIDTH)

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WHERE THE PREDETERMINED PARAMETER IS A QUEUE LENGTH, A LOWER THRESHOLD AND AN UPPER THRESHOLD FOR QUEUE LENGTH FOR THE PREDETERMINED STABLE REGION MAY BE DETERMINED BY:

If  $Q_{i\_avg} < Thr(Q_i)^{lower}$ ,  $B_i = maximum(B_i - \omega_i, Min(B_i))$

Else If  $Q_{i\_avg} > Thr(Q_i)^{upper}$ ,  $B_i = minimum(B_i - \omega_i, Max(B_i))$

$Delay\_jitter\_i = max Q_i / B_i$

WHEREIN, IF A JITTER UPPER BOUND  $Delay\_jitter\_i$  IS PRESELECTED, THEN A LINEAR RELATIONSHIP EXISTS BETWEEN  $max Q_i$  AND  $B_i$ , AN ALLOCATED BANDWIDTH.

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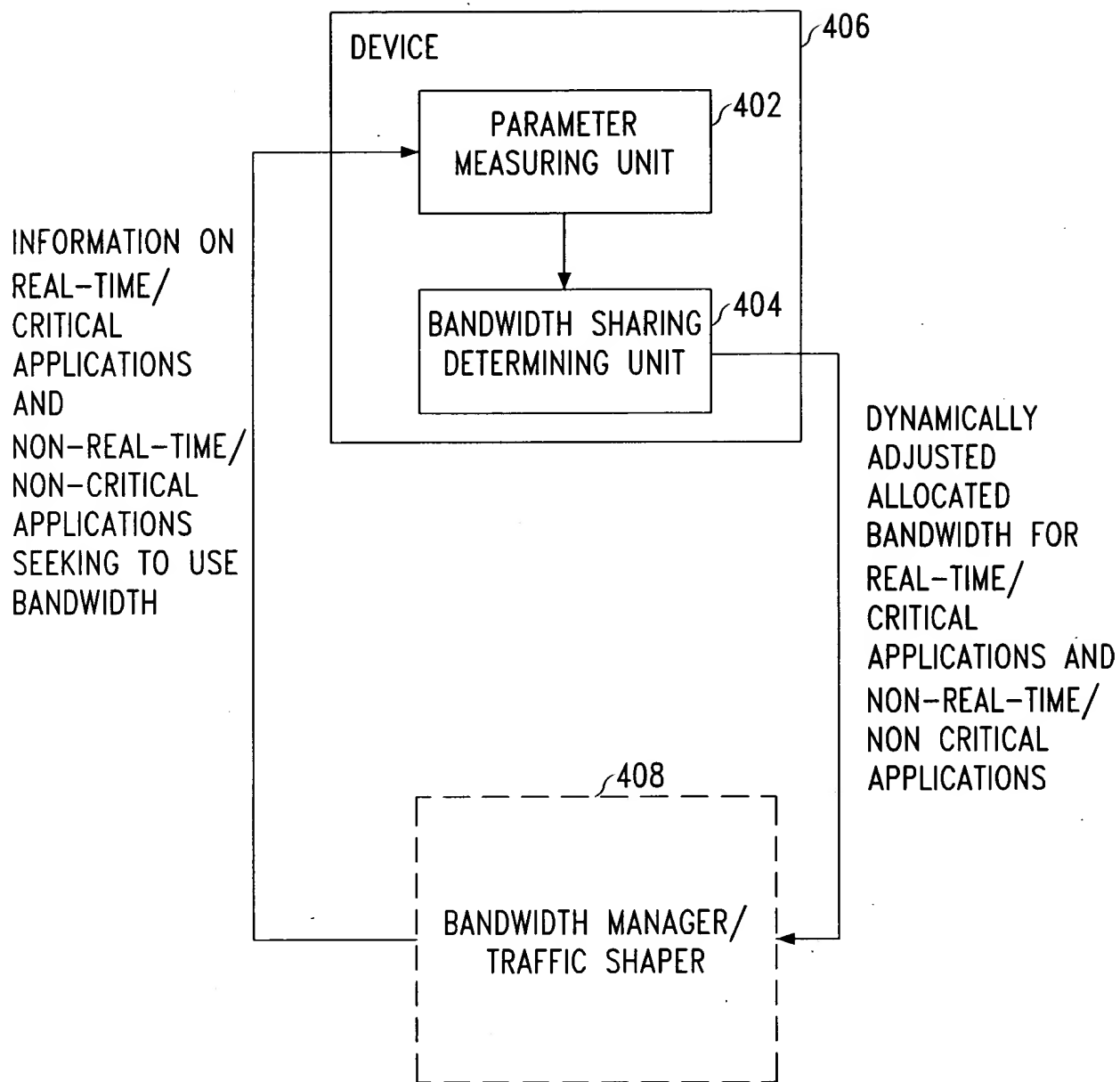


FIG. 4